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<p><b>(54) Title:</b> FURNITURE UPHOLSTERY APPARATUS AND METHODS</p>			
<p><b>(57) Abstract</b></p> <p>Upholstery attachment channels (2) of a generally arrowhead-shape are positioned linearly in furniture structural members (1). Upholstery fabric material (4) is sewn or otherwise attached to attachment extensions (5) of matching resilient arrowhead-shaped attachment members (3) that are insertable into the attachment channels to attach upholstery to furniture or to various structures. The generally arrowhead-shaped of the attachment channels and matching attachment members provide a reliable means for locking the attachment members to the attachment channels and, therefore, holding the upholstery to structures. Methods for upholstering and for re-upholstering living-area structures with high quality at minimized cost are provided.</p>			

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## FURNITURE UPHOLSTERY APPARATUS AND METHODS

### BACKGROUND OF THE INVENTION

5      1. Technical Field.

This invention relates to furniture framework, upholstery and methods. More particularly, it relates to furniture and living-area framework integrated with upholstery and surface-covering attachment devices and methods for constructing and for re-covering furniture, cabinets, living-area walls, 10 room dividers and other living-area surfaces. Typical uses include residential and commercial furniture, interior surfaces and furniture for buildings, boats, cars, aircraft and trains and other applications for which removable and replaceable covering is desired.

15      2. Description of Related Technology.

Attaching upholstery to furniture has been accomplished with a variety of devices and related methods. Highly common at present is merely tacking or stapling of the upholstery fabric to wood or plastic frames for furniture to be used in buildings or hooking it to metal parts for furniture to be used for vehicles and outdoor furniture. Notably more elaborate devices and methods are 20 described in the following patents:

Chassaing USA	1,246,544	Van Hove USA	1,977,026
MacInerney USA	1,724,946	Plume USA	3,817,041
Rissman USA	1,725,480	Archambault FRA	74,607
Zackrisson SWE	317,481		

25      In Chassaing, hemmed sides of a piece of canvas containing flexible beading are snaked into the ends of guideways on longitudinal carrying members of a stretcher. MacInerney teaches a metal track stick which has bendable flanges with marginal edges brought together by means of a tool after insertion of a welted hem of a piece of fabric. Van Hove shows an upholstery 30 clamping channel for a sprung automobile seat that has a bendable lower arm that functions like the flanges in MacInerney to retain a hemmed bead within a channel. In Rissman, the marginal portion of a skirt is inserted by means of a welt into an upholstery retaining channel. The channel is sufficiently resilient to permit its throat to be widened by means of a tool for insertion 35 of a welt, the throat closing upon removal of the tool to retain the welt in place. Plume shows an upholstery attachment system in which a vinyl strip sewn onto upholstery along a line of stitching is brought into mating engagement with a keeper strip attached to the article to which the upholster

is to be applied. The Archambault French reference teaches the insertion of a covering containing a metal or synthetic resin reinforcing member into a channel formed in a wooden base and closed at its front by a plate of metal or synthetic resin. The Zackrisson Swedish reference similarly shows the 5 insertion of the margin of a covering having a plastic or elastic cord through the resilient throat of a metal or plastic channel attached to underlying structure.

None of these patents teach a structural furniture framework in functional relationship to upholstery attachment with the versatility, high 10 quality, low cost and ease of re-upholstering of this invention.

#### SUMMARY OF THE INVENTION

In this invention, attachment channels of a generally arrowhead shape are positioned linearly to furniture framework members. Upholstery attachment 15 members with selective resiliency and cross-sectional arrowhead-shaped form are sewn or otherwise attached to upholstery and insertable into the attachment channels. The generally arrowhead shape of the attachment channels and matching attachment members provides a reliable form for locking the attachment members in the attachment channels. The furniture framework 20 members can be constructed of suitable plastic or other material that is moldable or machinable into forms for all types of furniture construction. There can be sufficiently high accuracy of measurement and attachment of 25 upholstery fabric materials to the attachment members that the upholstery fabric materials can be attached evenly and smoothly at low cost. When repairing the upholstery also, re-upholstery fabric materials can be attached to the furniture evenly and at low cost by less skilled workers than required for present furniture upholstering. A new and improved method of making, covering and re-upholstering furniture is provided by this invention.

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#### DESCRIPTION OF THE DRAWINGS

This invention is described and claimed in relation to the following drawings wherein:

FIG 1 is a cross-sectional end view of a structural member and attachment members in attachment channels in an embodiment of the invention suitable 35 primarily for injection molding of the frame parts.

FIG 2 is a cross-sectional end view of a structural member in an embodiment of the invention suitable primarily for extrusion molding.

FIG 3 is a cross-section end view of a structural member for an

embodiment of the invention suitable for either extrusion or injection molding and adaptable for a different variety of use conditions.

FIG 4 is sectional cutaway view of a means for joining structural members of the invention.

5 FIG 5 is a sectional cutaway view of a different means for joining structural members of the invention.

FIG 6 is a sectional cutaway view of a still another means for joining structural members of the invention.

FIG 7 is an end view of a slip-on type of covering for portions of the 10 invention which are not covered with upholstery fabrics.

FIG 8 is a front view of the slip-on covering of FIG 7.

FIG 9 is a sectional side view of the slip-on covering of FIGs 7 and 8.

FIG 10 is a sectional cutaway side view of an arrowhead-shaped attachment channel and matching arrowhead-shaped attachment member without double-15 endercut locking means.

FIG 11 is a cross-sectional end view of an embodiment of the invention with a single attachment channel parallel to a means for attachment to various furniture framework members and parts.

20 FIG 12 is a cross-sectional end view of an embodiment of the invention with a single attachment channel at right angles to a channel means for attachment to various furniture framework members and parts.

FIG 13 is a cross-sectional end view of an embodiment of the invention with a single attachment channel at an angle to a channel means for attachment to various furniture framework members and parts.

25 FIG 14 is a cross-sectional end view of an embodiment of the invention with a single attachment channel concentric with a single blade or nail means for attachment to various furniture framework members and parts.

FIG 15 is a cross-sectional end view of an embodiment of the invention with a single attachment channel with a right-angle corner means for 30 attachment to various furniture framework members and parts.

FIG 16 is a cross-sectional end view of an embodiment of the invention with a plurality of attachment channels in circumferential attachment to each other to form a furniture framework in back-to-back relationship.

35 FIG 17 is a cross-sectional end view of a structural member with selectively curved corners and straight sides.

FIG 18 is a cross-sectional end view of a structural member with sides and ends selectively curved.

## DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to FIG 1, furniture-frame structural member 1 is provided with generally arrowhead-shaped attachment channels 2 into which selectively-resilient collapsible furniture attachment members 3 are insertable.

5 Upholstery fabric 4 can be sewn or otherwise attached to upholstery-attachment extensions 5. Various types of upholstery components and fabrics such as upholstery welts 6, foam fabric 7 with foam 8, webbing 9 and bottom fabric 10 also can be sewn or otherwise attached to the upholstery-attachment extensions 5. Round dowel-pin orifices 11 can be either extended the length of the 10 structural members 1 or extended for only the working length of dowel pins into each end of the structural members 1.

With this general shape of the structural member 1, a typical method for constructing furniture and upholstering it would be to stretch fabric from one such structural member 1 to another at an opposite side or position on a piece 15 of furniture. Furniture upholstery fabric 4 and other upholstery components 6-10 can be sewn to the attachment extensions 5 before the attachment members 3 are inserted into the attachment channels 2.

20 The structural member 1 would appear similar to that shown in FIG 1 but with the fabric components attached to attachment extensions 5 facing in the opposite direction.

One of the attachment channels 2 is shown without an attachment member 3 inserted into it because this particular attachment channel 2 would not be used in this particular construction. Typically the structural members 1 would be constructed with various numbers and positions of channels in them 25 for a variety of construction alternatives. Then only those channels needed would be utilized. For a mass-production volume of furniture to be produced, only those channels 2 actually needed could be formed into the structural members 1.

This form of structural member 1 is intended primarily for injection-mold 30 fabrication because the thickness of its sections between channels 2 and dowel-pin orifices 11 are not sufficiently uniform nor sized and shaped for accurate extrusion-mold fabrication. The choice of injection-mold or extrusion-mold fabrication of the structural members 1 involves trade-off costs for dissemable forms for channels 2 and orifices 11 in comparison to 35 structural flexibility. Injection molding may be more expensive for dissemable forms but extrusion molding may not offer the extent of structural flexibility as a result of limitation to extrudable dimensions.

Referring to FIG 2, an extrusion-type structural member 12 is provided

with suitably uniform sections 13 between channels 2 and extrudably-shaped dowel-pin orifices 14. Also provided to maintain uniformity of sections 13, structural grooves 15 with optionally insertable filler members 16 are insertable and bondable in the structural grooves 15 after extrusion of the 5 extrudable structural member 12. One of the filler members 16 is shown partially inserted into a groove 15. It can be noted that the extrudably-shaped dowel-pin orifices 14 can be either round or rectangular as illustrated. The rectangular or, in this case, square dowel-pin orifices 14 are more accurately sized for extrusion molding but may require more expensive 10 dowel pins.

Referring to FIG 3, a single-pin-orifice structural member 17 is provided with a single-pin orifice 18 that can be either square or otherwise polygonal. In either form, walls 19 of orifice 18 can uniformly thick as illustrated. This is one form of extrudable structural member that allows wide flexibility 15 of size and shape with uniform thicknesses between channels 2 and the orifice 18. This embodiment feature of the invention allows selectively curved side walls as well as end walls while maintaining uniform sectional thicknesses.

Referring to FIG 4, structural-member ends 20 can be slanted with 45-degree angles to form 90-degree corners. Optionally, right-angle dowel pins 20 21 can be round as shown and insertable into dowel-pin orifices 22 that are either extended end-to-end through the structural member or long enough only to receive the dowel pins 21. There can be one or more of these right-angle dowel pins 21. But if they are round, it is advisable to have more than one dowel pin at each corner for stability of the joints.

25 Referring to FIG 5, structural member ends 20 can be provided with one rectangular angled dowel pin 23 that can provide integrity of the joint as a result of its polygonal form.

Referring to FIG 6, straight dowel pins 24 can be employed in cross-corner dowel-pin orifices 25. In this form also, it is preferable that there 30 be a plurality of such dowel pins 24.

Referring to FIGs 4-6, the angles of the ends 20 can be varied to achieve various corner angles as determined by the sum of the two end angles so joined.

Referring to FIGs 7-9, a structural member 1 can be covered with a slip-on 35 or otherwise attachable covering 26 shown from a top view in FIG 7, an end view in FIG 8 and a side view installed on structural member 1 in FIG 9.

Referring to FIGs 1 and 10, the arrowhead-shaped attachment channels can be either double-undercut with interlocking undercut grooves 27 as shown in

FIG 1, tapered or straight as shown in FIG 10. In either form, there can be a relatively narrow channel-entrance wall section 28 in proportion to a wide shoulder area 30. The walls can be straight all of the way to a point as illustrated in FIG 10 or they can be selectively rounded as shown in FIGs 1-3.

- 5 The attachment members also can be provided with either rounded shoulders 30 and rounded tips 31 as shown in FIG 1 or they can be pointed as illustrated in FIG 10. The channel-entrance walls section 28 can be provided with tapered sections 32 to facilitate insertion of the attachment members 3 into the attachment channels 2.
- 10 Referring to FIGs 11-18, a variety of forms of the structural member can be provided within the intent of this invention. Shown here are some of the more prominent forms but not all that are foreseeable within the scope of this invention.

FIG 11 illustrates an attachment channel 2 with its axis concentric with the axis of a double-walled structural member 33.

FIG 12 illustrates an attachment channel 2 with its axis at right angles to the axis of a double-walled structural member 33.

FIG 13 illustrates an attachment channel 2 with its axis at a select angle from the axis of a double-walled structural member 33.

20 FIG 14 illustrates an attachment channel 2 in relationship to an insertable structural member 34 that can be either a series of nail-like members, a blade-like form or combination thereof.

FIG 15 illustrates an attachment channel 2 in relationship to a right-angled structural member 35. In place of the right angle, there can be a 25 selectively different angle for the structural member. Also for the structural member illustrated in FIGs 11-13, the double-walled structural member can be constructed with its walls either parallel as shown or at a selectively different angle.

FIG 16 is a generally circumferential structural member 36 with 30 attachment channels 2 positioned in back-to-back arrangement to form a selective form of the structural member. There can be a complete circular arrangement or a partial circle arrangement as selected. Also, the attachment channels can be positioned in opposing-end relationship if desired.

FIG 17 illustrates a straight-walled structural member 37 with rounded 35 corners 38.

FIG 18 illustrates a selectively curved-wall structural member 39.

Referring to FIGs 1 and 10, a hollow center 40 of the attachment members 3 can be provided for the dual purposes of aiding flexibility and for cutting

into for ease of removal of special heavy-duty attachment members 3. Typically, the attachment extension 5 can be constructed sufficiently strong for pulling the attachment members 3 out for ease of removal and replacement of upholstery and other surface coverings. In addition to low-cost and reliable construction, ease of removal and re-upholstering or re-covering of furniture and other living-area surfaces are fundamental advantages of this invention.

Furniture-frame structural members 1 are intended also for room walls, room-divider walls, cabinet walls and other living-area surfaces.

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## CLAIMS

What is claimed is:

1. A furniture upholstery apparatus having:  
furniture-frame structural members;
- 5      arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;  
selectively-resilient collapsible upholstery-attachment insertable  
10     members which are generally arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels and;  
upholstery attachment extensions of the insertable members to which  
15     upholstery fabric can be attached.
2. A furniture upholstery apparatus according to claim 1 wherein the counter-grooved locking sections of the attachment channels are doubly counter-grooved outwardly towards surfaces of the structural members and to greater width of the channels.
- 20     3. A furniture upholstery apparatus according to claim 2 wherein shoulders of the insertable member are undercut to fit snugly into the counter-grooved locking sections of the attachment channels.
- 25     4. A furniture upholstery apparatus according to claim 3 wherein the depth of the attachment channels inwardly from counter-grooved locking sections is sufficient to allow the insertable members to be inserted into the attachment channels far enough for the undercut shoulders of the insertable members to expand to a locked condition under the doubly counter-grooved locking sections of the attachment channels.
- 30     5. A furniture upholstery apparatus according to claim 1 wherein the slanted walls at opposite sides of the channels are curved selectively and form a selective curve at their juncture.
- 35     6. A furniture upholstery apparatus according to claim 1 wherein arrowhead shoulders and points of the insertable members are selectively curved.
- 35     7. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with parallel members that are parallel to the axis of the arrowhead-shaped attachment channel and attachable to opposite sides of a rod insertable between the parallel members.

8. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with parallel members that are selectively off-centered from the axis of the arrowhead-shaped attachment channel and attachable to opposite sides of a rod insertable between the parallel members.
- 5 9. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a single member extended concentrically with the center of the axis of the arrowhead-shaped attachment channel and insertable into a structure to be upholstered.
- 10 10. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a single member extended in an off-centered direction from the axis of the arrowhead-shaped attachment channel and attachable to a structure to be upholstered.
- 15 11. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a plurality of arrowhead-shaped attachment channels arranged in side-to-side relationship and facing in opposite directions.
- 20 12. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a plurality of arrowhead-shaped attachment channels arranged in side-to-side relationship with axes projected radially from a common point.
13. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a hollow circular framework with an outside periphery from which arrowhead-shaped attachment channels are extended selectively.
- 25 14. A furniture upholstery apparatus according to claim 1 wherein the structural member is provided with a hollow rectangular framework with outside walls from which arrowhead-shaped attachment channels are extended selectively.
- 30 15. A furniture upholstery apparatus according to claim 1 wherein the structural member is comprised of a generally rectangular member having selectively curved corners and edges and further comprising:  
one arrowhead-shaped attachment channel positioned in each end and a plurality of arrowhead-shaped attachment channels positioned in each side of the structural member.
- 35 16. A furniture upholstery apparatus according to claim 15 and further comprising:  
a selectively-sized-and-shaped dowel-pin orifice with axis parallel to the axis of the rectangular structural member in each end of the rectangular

member

17. A furniture upholstery apparatus according to claim 1 wherein the structural member is comprised of a generally rectangular member having selectively curved corners and edges and further comprising:

5 a multiplicity of selectively-sized-and-shaped dowel-pin orifices in each end of the rectangular structural member.

18. A furniture upholstery apparatus according to claim 17 and further comprising:

10 one arrowhead-shaped attachment channel positioned in each end and a plurality of arrowhead-shaped attachment channels positioned in each side of the structural member.

15 19. A furniture upholstery apparatus according to claim 18 wherein the multiplicity of selectively-sized-and-shaped dowel-pin orifices are extended throughout the length of and parallel to the axes of the structural members.

20. A furniture upholstery apparatus according to claim 19 wherein ends of the rectangular structural members are angled selectively to be joinable end-to-end at select angles with other structural members that are selectively angled.

21. A furniture upholstery apparatus having:

furniture-frame structural members that are generally rectangular with selectively curved corners and edges;

25 arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

30 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels;

upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

35 two selectively-sized-and-shaped dowel-pin orifices extended throughout the length of and parallel to the axes of the structural members;

one arrowhead-shaped attachment channel positioned in each end of the structural member;

one arrowhead-shaped attachment channel positioned at one side of the

structural member at a position intermediate the two dowel-pin orifices and;

two arrowhead-shaped attachment channels positioned at the opposite side of the structural member from the single channel with one positioned intermediate one end and one dowel-pin orifice and the other positioned intermediate the opposite end of the structural member and the other dowel-pin orifice.

5 22. A furniture upholstery apparatus according to claim 21 wherein the dowel-pin orifices are circular.

10 23. A furniture upholstery apparatus according to claim 21 wherein ends of the rectangular structural members are angled selectively to be joinable end-to-end at select angles with other structural members having mating dowel-pin orifices that are selectively angled.

15 24. A furniture upholstery apparatus having furniture-frame structural members that are generally rectangular with selectively curved corners and edges;

20 25. arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

25 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels;

upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

two selectively-sized-and-shaped dowel-pin orifices extended throughout the length of and parallel to the axes of the structural members;

30 35 a plurality of arrowhead-shaped attachment channels positioned selectively in the outside walls of the structural member in relation to the dowel-pin orifices and;

walls of the structural members between arrowhead-shaped attachment channels and dowel-pin orifices being a generally uniform thickness idealized in proportion to dimensional proportions of walls of the dowel-pin orifices and the attachment channels for extrusion-manufacture with select extrusion materials.

25. A furniture upholstery apparatus according to claim 24

wherein ends of the rectangular structural members are angled selectively to be joinable end-to-end at select angles with other structural members with mating dowel-pin orifices that are selectively angled.

26. A furniture upholstery apparatus according to claim 24  
5 wherein the dowel-pin orifices are generally circular and further comprising:

one arrowhead-shaped attachment channel positioned at each end of the structural member;

one arrowhead-shaped attachment channel positioned intermediate the two dowel-pin orifices at one side of the structural member;

10 two arrowhead-shaped attachment channels at the opposite side of the structural member with one attachment channel positioned intermediate between one end and one dowel-pin orifice and the other attachment channel positioned intermediate between the opposite end and the other dowel-pin orifice and;

15 thickness-adjustment grooves selectively sized, shaped and positioned between attachment channels and dowel-pin orifices to maintain idealized thickness of walls for extrusion-manufacture with select extrusion materials.

27. A furniture upholstery apparatus according to claim 26 and further comprising:

20 filler members insertable in the thickness-adjustment grooves to provide relative smoothness of surfaces of the structural members between attachment channels.

28. A furniture upholstery apparatus according to claim 24  
wherein the dowel-pin orifices are selectively polygonal with intermediate walls slanted relative to each other and generally parallel to slanted walls  
25 of the arrowhead-shaped attachment channels adjacent thereto.

29. A furniture upholstery apparatus according to claim 28  
wherein a wall dividing the two dowel-pin orifices opposite the joining line of the sides of the attachment between the two dowel-pin orifices is terminated at a select distance from each end of the structural members such  
30 that the two slanted polygonal dowel-pin orifices then form an angular dowel-pin orifice at ends of the structural members.

30. A furniture upholstery apparatus according to claim 29  
wherein ends of the rectangular structural members are angled selectively to be joinable end-to-end at select angles with other structural members with  
35 mating dowel-pin orifices that are selectively angled.

31. A furniture upholstery apparatus according to any one of claims 1 and 5-30 in which:

the counter-grooved locking sections of the attachment channels are

doubly counter-grooved outwardly towards surfaces of the structural members and to greater width of the channels;

shoulders of the insertable members are undercut to fit snugly into the counter-grooved locking sections of the attachment channels and;

5 the depth of the attachment channels inwardly from counter-grooved locking sections is sufficient to allow the insertable members to be inserted into the attachment channels far enough for the undercut shoulders of the insertable members to expand to a locked condition under the doubly counter-grooved locking sections of the attachment channels.

10 32. A method for manufacture of a furniture upholstery apparatus consisting of:

furniture-frame structural members;

15 arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

20 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels and;

upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

comprising:

25 forming extrudable material in structural configurations having generally uniform-thickness connecting walls between them and extruding the material.

33. A method for using a furniture upholstery apparatus consisting of:

furniture-frame structural members that are generally rectangular with 30 selectively curved corners and edges;

arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

35 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking

section of the attachment channels;

upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

two selectively-sized-and-shaped dowel-pin orifices extended throughout

5 the length of and parallel to the axes of the structural members;

a plurality of arrowhead-shaped attachment channels positioned selectively in the outside walls of the structural member in relation to the dowel-pin orifices and;

walls of the structural members between arrowhead-shaped attachment

10 channels and dowel-pin orifices being a generally uniform thickness idealized in proportion to dimensional proportions of walls of the dowel-pin orifices and the attachment channels for extrusion-manufacture with select extrusion materials;

comprising:

15 shaping ends of the structural members in select angles having mating sizes and dowel-pin orifice configurations to form select furniture framework;

joining the ends of such cut structural members by inserting and selectively bonding mating dowel pins in the mating dowel-pin orifices;

pre-cutting and attaching select upholstery material to the upholstery

20 attachment extensions of the insertable members to which upholstery fabric can be attached and;

inserting the arrowhead-shaped selectively-resilient collapsible upholstery-attachment insertable members into attachment channels in accordance with design objectives relative to shape and form of furniture

25 components so upholstered.

34. A method for using a furniture upholstery apparatus according to claim 33 and further comprising:

covering sections of structural members selectively not covered with upholstery extended between structural members with select ornamental and

30 functional materials.

35. A method for using a furniture upholstery apparatus according to claim 34 wherein the select ornamental and functional material is comprised of a selectively resilient material with snugly-fitting slip-on relationship to structural members to which it is attachable.

35 36. A method for manufacture of a furniture upholstery apparatus consisting of:

furniture-frame structural members;

arrowhead-shaped attachment channels which are narrower at a top opening

section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

5 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels and;

10 upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

comprising:

15 injection molding of injection-moldable material into mold forms with inside peripheries in shapes and sizes of frames of select structural members in which solid channel-member forms are positioned where selected for the attachment channels and then removing the channel-member forms linearly from the injection-moldable material after it has solidified sufficiently to maintain design shape of the structural members.

20 37. A method for manufacture of a furniture upholstery apparatus consisting of:

25 furniture-frame structural members that are generally rectangular with selectively curved corners and edges;

30 arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

35 selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels;

40 upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

45 a plurality of selectively-sized-and-shaped dowel-pin orifices at the ends of the frame structural members and;

50 multiple arrowhead-shaped attachment channels linear to the axis of the frame structural member positioned selectively in the periphery of the structural member;

comprising:

injection molding of injection-moldable material into mold forms with inside peripheries in shapes and sizes of frames of select structural members in which solid channel-member forms and solid dowel-pin forms are positioned where selected for the attachment channels and dowel pins and then removing

5 the channel-member forms and dowel-pin forms linearly from the injection-moldable material after it has solidified sufficiently to maintain design shape of the structural members.

38. A method for manufacture of a furniture upholstery apparatus consisting of:

10 furniture-frame structural members that are generally rectangular with selectively curved corners and edges;

arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and

15 longitudinal to linear dimensions of the structural members;

selectively-resilient collapsible upholstery-attachment insertable members which are arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking

20 section of the attachment channels;

upholstery attachment extensions of the insertable members to which upholstery fabric can be attached;

a plurality of selectively-sized-and-shaped dowel-pin orifices at the ends of the frame structural members and;

25 multiple arrowhead-shaped attachment channels linear to the axis of the frame structural member positioned selectively in the periphery of the structural member;

comprising:

30 injection molding of injection-moldable material into mold forms with inside peripheries in shapes and sizes of frames of select structural members in which disassemblable sections of solid channel-member forms and solid dowel-pin forms are positioned where selected for the attachment channels and dowel pins and then removing the channel-member forms through narrow sections of the arrowhead-shaped attachment channels after disassembling them to be

35 removable through such narrow sections of the arrowhead-shaped attachment channels and removing the dowel-pin forms linearly from the injection-moldable material after the frame structural member has solidified sufficiently to maintain design shape of the structural members.

39. A furniture upholstery apparatus according to claim 1 wherein the attachment extensions are sufficiently strong relative to resiliency of the attachment members that the attachment members can be removed by hand-grasping and pulling the attachment extensions.

5 40. A furniture upholstery apparatus according to claim 21 wherein the attachment extensions are sufficiently strong relative to resiliency of the attachment members that the attachment members can be removed by hand-grasping and pulling the attachment extensions.

10 41. A furniture upholstery apparatus according to claim 24 wherein the attachment extensions are sufficiently strong relative to resiliency of the attachment members that the attachment members can be removed by hand-grasping and pulling the attachment extensions.

42. A furniture upholstery apparatus according to claim 1 and further comprising:

15 a hollow center in the attachment member such that resiliency of the attachment member can be enhanced and the attachment member can be cut selectively into the hollow center for removal of particularly non-resilient attachment members.

43. A furniture upholstery apparatus according to claim 21 and further comprising:

20 a hollow center in the attachment member such that resiliency of the attachment member can be enhanced and the attachment member can be cut selectively into the hollow center for removal of particularly non-resilient attachment members.

25 44. A furniture upholstery apparatus according to claim 24 and further comprising:

30 a hollow center in the attachment member such that resiliency of the attachment member can be enhanced and the attachment member can be cut selectively into the hollow center for removal of particularly non-resilient attachment members.

45. A furniture upholstery apparatus according to claim 1 wherein the furniture-frame structural members are sized and shaped selectively for edges of room walls, room dividers and cabinets.

35 46. A furniture upholstery apparatus according to claim 21 wherein the furniture-frame structural members are sized and shaped selectively for edges of room walls, room dividers and cabinets.

47. A furniture upholstery apparatus according to claim 24 wherein the furniture-frame structural members are sized and shaped selectively for

edges of room walls, room dividers and cabinets.

48. A method for using a furniture upholstery apparatus consisting of:

- 5       furniture-frame structural members;
- 10      arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;
- 15      selectively-resilient collapsible upholstery-attachment insertable members which are generally arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels and;
- 20      upholstery attachment extensions of the insertable members to which upholstery fabric has been attached and used for an intended use-life and which are sufficiently strong relative to resiliency of the attachment members that the attachment members can be removed by hand-grasping and pulling the attachment extensions and;
- 25      comprising:
  - 30      re-covering an upholstered surface by hand-grasping the attachment extensions of the insertable attachment members to which covering has been attached;
  - 35      pulling the attachment extensions outwardly from the attachment channels until the attachment members are removed from the structural members;
  - 40      attaching new covering to extension members and;
  - 45      inserting the extension members into the attachment channels to recover the upholstered surface.

49. A method for using a furniture upholstery apparatus consisting of:

- 30      furniture-frame structural members;
- 35      arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;
- 40      selectively-resilient collapsible upholstery-attachment insertable members which are generally arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-

grooved locking section of the attachment channels;  
upholstery attachment extensions of the insertable members with hollow centers to which upholstery fabric has been attached and used for an intended use-life;

5     hollow centers in the attachment members and;  
low strength of the attachment extensions relative to resiliency of the attachment members and;  
comprising;  
re-covering an upholstered surface by inserting a bladed cutting member

10    into the attachment members at one side of the attachment extensions to a depth sufficient to encounter the hollow centers;  
drawing the bladed cutting member from one end to the other of a structural member with an attachment channel in which the attachment member has been inserted such that the attachment member is cut linearly and changed

15    from a generally arrowhead-shaped member to a generally flat coiled member in the attachment channel;

grasping the attachment extension and pulling it until the changed form of the attachment member is removed from the attachment channel;

20    attaching new covering to the attachment extensions of new attachment members and;  
Inserting the attachment members into the attachment channels.

50. A method for using a furniture upholstery apparatus consisting of:  
furniture-frame structural members which are sized and shaped

25    selectively for edges of room walls, room dividers and cabinets;  
arrowhead-shaped attachment channels which are narrower at a top opening section than at a counter-grooved locking section from which walls at opposite sides of the channels are slanted towards a line of contact within and longitudinal to linear dimensions of the structural members;

30    selectively-resilient collapsible upholstery-attachment insertable members which are generally arrowhead-shaped at a cross-sectional area of a linear form with a size and shape to be insertable into the attachment channels with arrowhead shoulders containable in locking mode at the counter-grooved locking section of the attachment channels and;

35    upholstery attachment extensions of the insertable attachment members to which selective wall-covering materials can be attached and;  
comprising;  
sizing and shaping of the frame structural members selectively for edges

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of living-area surfaces such as room walls, room dividers and cabinets;  
positioning the frame structural members at edges of living-area surfaces;  
attaching the frame structural members selectively to each other and to  
5 structural members of the living-area surfaces;  
measuring and cutting covering material selectively for fitting the  
living-area surfaces when attached to the attachment extensions;  
attaching edges of the covering material to the extension members and;  
inserting the attachment members into the attachment channels.

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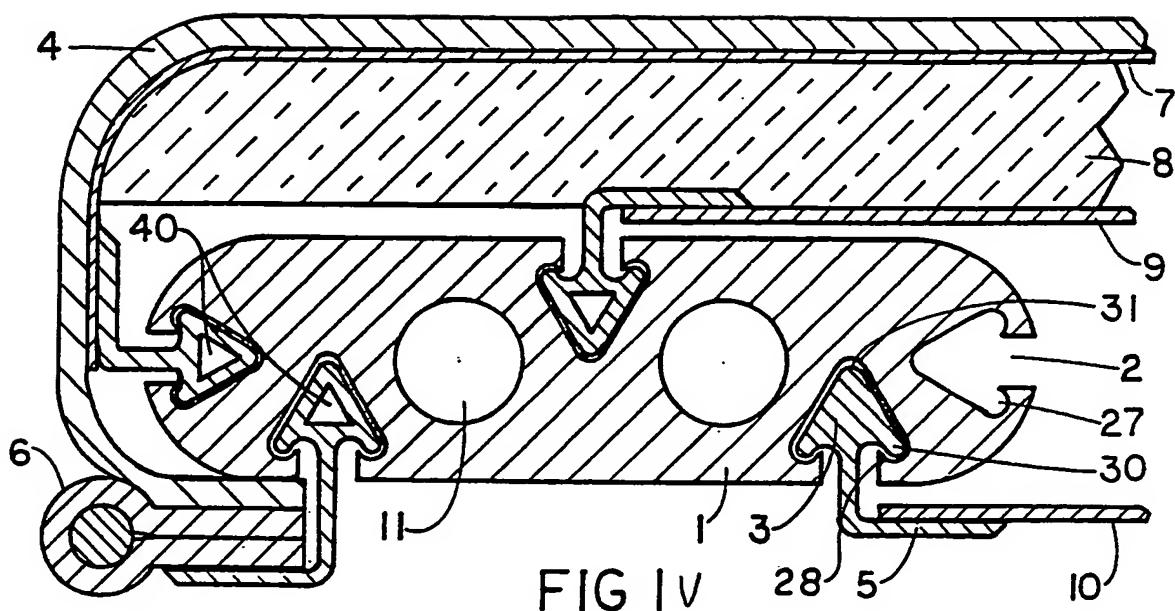


FIG 2

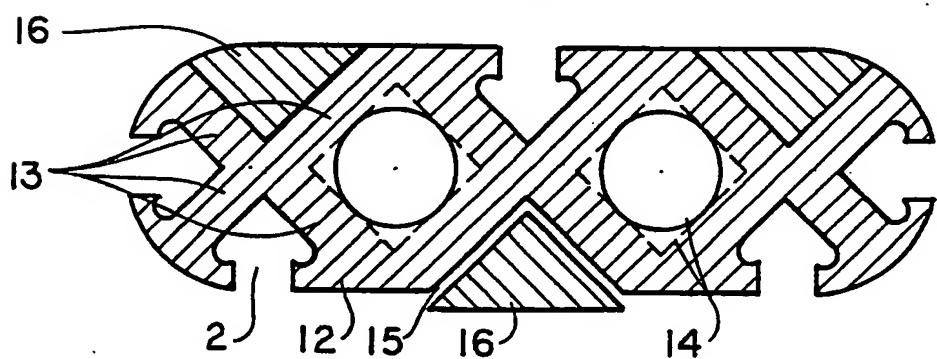
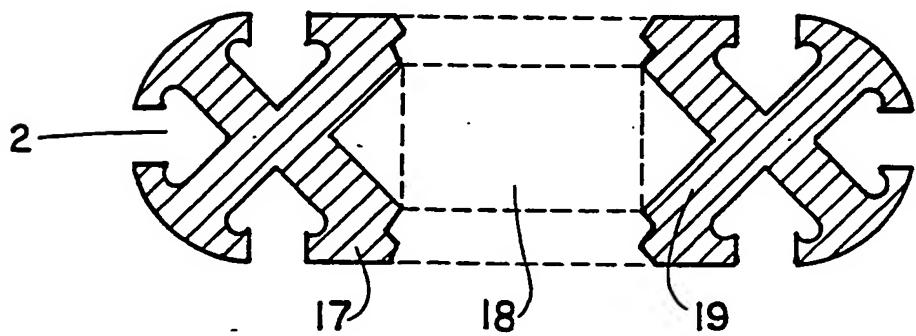


FIG 3



2/2

FIG 4

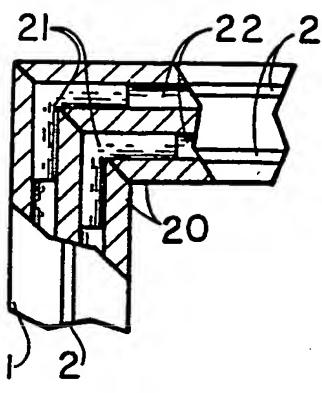


FIG 5

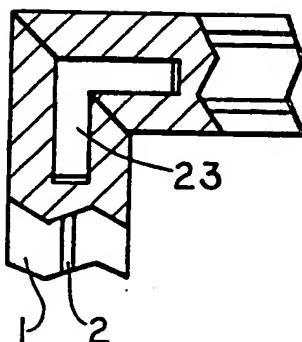


FIG 6

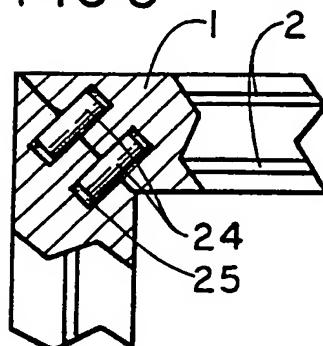


FIG 9

FIG 10

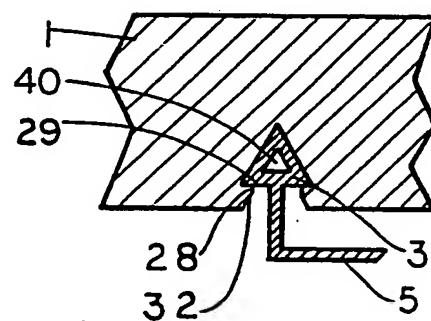
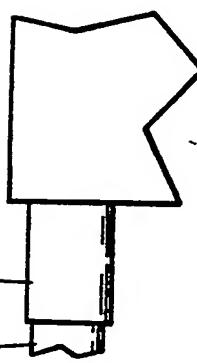


FIG 7

FIG 8

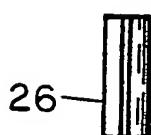


FIG 11

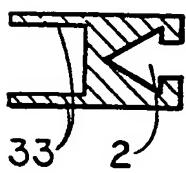


FIG 12

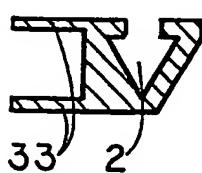


FIG 13

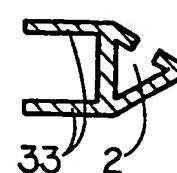


FIG 14

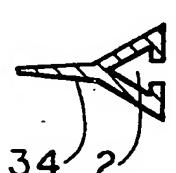


FIG 15

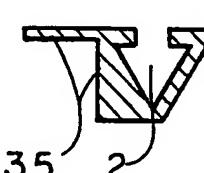


FIG 16

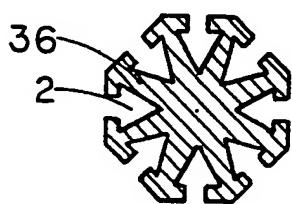


FIG 17

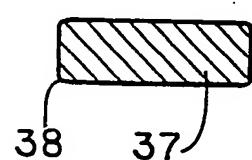
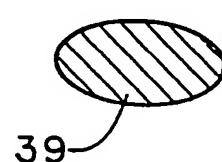


FIG 18



# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 89/03386

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) <sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC  
**Int. C1. (4): A47C 31/02; A47C 27/00; A44B 11/25**  
**U.S. C1. 5/402; 297/218; 24/587**

## II. FIELDS SEARCHED

Minimum Documentation Searched <sup>7</sup>

Classification System	Classification Symbols
US	5/402,403,404,405,406,407; 297/218,219,455 24/72.5,587,618,619,697; 160/392,395,398,404

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>

## III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup>

Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
Y	US, A, 4,789,201 (SELBERT) 06 December 1988	1-50
Y	US, A, 1,246,544 (CHASSAING) 13 November 1917.	1-50
Y	US, A, 4,817,188 (VAN ERDEN) 28 March 1989	2
Y	US, A, 4,731,911 (GOULD) 22 March 1988.	24,26,32,33
Y	US, A, 4,581,269 (TILMAN) 08 April 1986.	45
Y	US, A, 4,020,884 (JADOT) 03 May 1977.	4
Y	US, A, 3,961,661 (TOMBU) 08 June 1976.	46
Y	US, A, 2,655,239 (KENLOCK) 13 October 1953.	2
Y	US, A, 2,585,438 (CLINGMAN) 12 February 1952.	42-44
Y	US, A, 2,097,988 (ROSS) 02 November 1937.	47
Y	DE, A, 3,212,568 (DAIMLER) 13 October 1983.	6
Y	US, A, 4,510,634 (DIERICH) 16 April 1985.	7
A	US, A, 4,364,607 (TAMBURINI) 21 December 1982.	
Y	US, A, 4,151,665 (GIBBY) 01 May 1979.	29
A	US, A, 3,995,892 (HELLMAN) 07 December 1976.	
Y	US, A, 3,950,869 (SAMARIN) 20 April 1976.	7
A	US, A, 3,737,922 (WARNER) 12 June 1973.	
A	US, A, 3,216,029 (FRITZMEIER) 09 November 1965.	
A	US, A, 2,839,126 (O'NEIL) 17 June 1958.	
A	US, A, 1,724,946 (MACINERNEY) 20 August 1929.	
Y	US, A, 515,814 (BRAUN) 06 March 1894.	30

\* Special categories of cited documents: <sup>10</sup>

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search

24 October 1989

International Searching Authority

ISA/US

Date of Mailing of this International Search Report

14 NOV 1989

Signature of Authorized Officer

*Michael Milano*  
Michael Milano

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	FR, A, 2,260,972 (FLEXICO) 12 September 1975.	
A	FR, A, 1,187,093 (ARCHAMBAULT) 26 December 1960.	
A	DE, A, 2,513,833 (COX) 09 October 1975.	

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